(about 200° Fah.), immerse quickly in a bath of melted tin. Remove, and drain. To obtain a thicker coat of tin submerge again in the tin bath, heated but little above the melting point.

(37) H. W. makes this suggestion with regard to leaky skylights, in response to the inquiry of B. P. L.: My practice has been to put on a good stiff coat of paint and sand it. The paint should set hard on the glass and the sand be thoroughly dry. I sometimes have to repeat it, but not often. However, a second coat of paint and sand renders it much more durable.

(38) E. C. H. writes: I wish to increase the draught of my engine. If I introduce the exhaust a foot or two from the top of the chimney, will it be likely to injure the chimney, and will it increase the draught? The chimney is 22 feet high, brick, square, and 2 feet in clear. A. We think the exhaust will not injure the chimney, and will increase the draught.

Will you please give me number of threads per inch of a ⅜ inch pipe tap? A. Eighteen.

(39) W. H. T. asks: What is the best and cheapest method of annealing small castings? A. Heat them for 6 hours inclosed in a box and surrounded with lime, and allow them five or six hours to cool, by covering the box (after extraction from the fire) with sand.

(40) I. K. asks: What is the pulling or pushing force of the average locomotive? A. About one sixth of the weight on its driving wheels.

Will a singlelens, double convex, answer for a camera to view landscapes, etc.? A. Such a lens will answer.

Will a boiler of the following dimensions furnish steam sufficient for a 3 horse engine: height 48 inches, diameter 22 inches, with 30 tubes 2 inches in diameter and 36 inches long? A. It probably will, if the engine is well designed.

(41) W. T. R. writes: Can you suggest any way of preventing brass stencil plates from affecting the color of the paint used? A. Lacquering the plates may answer, but nickel plating would doubtless be preferable. Varnish would probably soon wear off.

(42) "Inquirer" writes: Please give me a recipe for making mucilage. A. Dissolve gum dextrin in hot water with the addition of a little acetic acid.

What will keep washing blue from settling? A. Agitate the water.

(43) R. E. B. asks for a recipe for a ladies' shoe polish? A. Borax, 1 part; shellac, 4 parts; dissolve by continued boiling in a small quantity of water, and color with soluble aniline black or black ink.

(44) G. W. & Sons write: We are troubled a great deal with organic matter in water used in our brewery. Could we remedy it by first precipitating the organic matter and clayey parts of the water with potassium permanganate and alum, and then filter through sand and bone charcoal? We think that the filter would require less cleaning by first precipitating the organic matter and clay. A. Yes; but sulphate of alumina is preferable to alum. Dr. Crookes recommends the following mixture: Calcium permanganate, 1 part; aluminum sulphate, 10 parts; fine clay, 30 parts. The potassium permanganate may be used in place of the lime salt. He finds that one part of this mixture will purify almost instantly 5,000 parts of foul ditch water or sewage; it settles quickly, and the supernatant liquid may after fifteen minutes be drawn off without filtration.

(45) S. B. asks: How much will a well seasoned stick of timber (Southern pine or oak), 50 feet long, vary in length by a change in the temperature of 100° Fah.? A. There is no absolute formula for such cases, the change in dimensions depending upon a variety of elements, such as the grain of the wood, the nature of seasoning, etc. No timber is absolutely dry, and will consequently continue to shrink irregularly as further portions of moisture are evaporated; while the same stick changes character from day to day as the humidity of the air varies. Alterations in shape are therefore rather due to hygroscopic than thermal variations, and hence wood cannot be classed, in regard to expansion and contraction, with substances which, like the metals, have a definite coefficient of expansion. The change in length will be usually less than one third the alteration in cross section. In practice it is disregarded.

(46) A. B. asks: How may pencil marks be removed? A. We believe that rubber or a steel eraser are the only means.

(47) L. D. asks how to purify impure well water. A. Reduce separately to fine powder and mix thoroughly 30 parts fine clay, 10 parts sulphate of alumina, and 1 part of permanganate of lime. Add this to the impure water in the proportion of 10 to 30 grains to the gallon (depending of course upon its impurity), agitate, and allow to settle for half an hour. Less must be used if detected in the taste or color of the water after settling. Permanganate of soda or potassa may be used if the lime salt cannot be obtained.

(48) E. S. wishes to know the number of pounds of chloride of calcium required to bring a cubic foot of water to a density of 30° Baumé. A. About 28 lbs., under ordinary conditions.

(49) J. T. asks: What will restore hard rubber goods when tarnished? A. Sometimes repolishing; often nothing.

(50) G. S. asks: What was the fastest run of the Jarrett & Palmer "Centennial" train? A. Ninety miles in 99 minutes, Jersey City to West Philadelphia, without stop.

(51) E. D. R. wishes to know whether isinglass is identical with mica. A. Isinglass is the name given to a gelatin properly prepared from the sounds or air bladders of fish. The name was also applied by Hill, in 1771, in his work on "Fossils," to large sheets or plates of muscovite (the most common of the mica group) to distinguish it from the small particles constituting mica schist. The name is, however, properly restricted to fish gelatin.

(52) F. J. O. writes: I have been experimenting in transferring printing and lithographs on wood for engraving. I find certain kinds of hard varnish printing and lithograph inks I can make no impression on. I have used strong solutions of caustic potash and alcohol, strong potash lye, glycerin, all to no purpose. Can you give a recipe for a solution that will loosen these hard inks and yet not destroy the picture? A. Try the following: carbon disulphide, 95 parts; absolute alcohol, 5 parts.

(53) E. L. B. asks for a recipe for a preparation to put on plow castings after they are polished, so as to retain the polish and keep the metal from rusting. A. Cover with a mixture of white lead and tallow when not in use.

(54) F. A. S. writes: Having learned by experience what a nuisance a leaky stovepipe, like that of A. H. J. (p. 75, current volume), may become, let me prescribe a remedy which I have found successful. In the first elbow from the stove I cut out a strip of the iron 2½ x 4 inches, and had a sliding cover for the opening. I open it some every day, and always at bedtime, and leave it till morning. The pipe has never dripped since I began this treatment, and is as clear and dry as when put up.

(55) H. A. F. writes: I have a gold pen which has too coarse a nib. Is there any way in which I can sharpen it without sending to a manufacturer? A. We doubt whether you can alter it successfully, if you have no experience.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

R. H.—It is an excellent quality of asbestos.—E. P. B.—It is zinc blende—zinc sulphide. Of some value.—Mrs. S. C.—It appears to be the dried bark of the black willow (*salix nigra*).—A. R. C.—Brick clay is not quoted in the market; it could be bought at about $2 or $3 per ton; fire clay, $5 to $7 a ton. J. F. H. & Bro.—It is a ferruginous shale—composed principally of silicate of alumina or clay and silicious sand, colored by sesquioxide of iron.—S. J.—The sample is an excellent guano. An analysis would determine its value.—L. G.—The platinum sand is of value. The clayey asbestos might be used by paper makers. Sample of diamond earth not received.—D. V.—It is a ferro-cupric sulphide in quartz gangue.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects:

The Phonograph. By J. C. D.
Velocipede Travel. By T. B. and W. E. G.
"Multum in Parvo." By L. S. B.
The Oroheliograph. By G. B. S.
Mechanical Adjustment by Mirrors. By A. S. C.
An Astronomical Myth. By W. I. L.
The Rail Puzzle. By H. G. U., D. J. C., and "Vulcan."
Electrical Phenomena. By A. E. H.
A New Motor. By H. S. M.
The Safety Valve. By T. J. L.
Snake Cannibalism. By F. N. P.
Mind Reading. By J. L.
Gravitation. By G. V.

HINTS TO CORRESPONDENTS.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

OFFICIAL.

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

February 26, 1878,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

Ale or beer measure, T. Miller 200,744
Anchor, Spedden & Stafford 200,673
Ax machine, C. L. Jeffords 200,616
Axle, car, G. W. Millington 200,798
Axle, car, G. W. Miltimore 200,746
Baby jumper and carriage, M. P. Gillen 200,652
Bale tie, F. Cook 200,644
Bale tie, Cook & Shaw 200,700
Bale tie, A. E. Kimberly 200,659
Bale tie, J. C. Riethmuller 200,764
Bale tie, Shaw & Cook 200,672
Bale tie, N. W. Speers 200,775
Barometer, R. M. Lowne 200,739
Barrel trussing machine, H. W. King 200,733
Bending machine, sheet metal, C. Brombacher 200,689
Bending tubular sockets, J. H. Alker 200,595
Binder, J. F. Tapley 200,630
Bit brace, H. L. Pratt 200,757
Boat knee, D. True 200,632
Boat, portable folding, N. A. Osgood 200,664
Bobbin and spool, R. C. Fay 200,706
Boilers, domestic, T. & T. L. James 200,727
Book and cover, J. W. H. Reisinger 200,762
Bookbinder's beveling machine, H. W. Kokker 200,804
Book shelf, S. A. Smith 200,778
Boot and shoe holder, N. Lyon 200,619
Bottle stopper fastener, G. F. Outten 200,666
Bracket, R. B. Sanderson 200,767
Bracket for book shelves, S. A. Smith 200,772
Brake, car, W. L. Card 200,602
Breweries, washing shavings in, F. Hinckel (r) 8,099
Broiler, J. McConnell 200,622
Brush for scrubbing, G. W. Lee 200,736
Buggy top, I. Z. Merriam 200,797
Bustle and pannier, S. Dixon 200,647
Button fastener, H. Burtey 200,691
Candlestick, J. McCarthy 200,661
Cans, casing for, A. F. Tripp 200,806
Car coupling, W. N. Patteson 200,752
Car, dumping, M. Van Wormer 200,813
Car, stock, W. H. Hayes 200,719
Chain making machine, J. J. White 200,677
Chair, rocking, Willershausen & Rhoner 200,809
Charcoal kilns, operating, W. A. Miles 200,662
Clasp and buckle, J. R. Judd 200,658
Clasp for garments, W. B. Walker 200,633
Clay machine, G. D. Goodrich 200,791
Clock case manufacture, N. Allen 200,596
Cloth, gigger for napping, Woelfel & Massey 200,784
Coal, purifying, P. F. Morey 200,663
Coffee and spice mill, T. Strobridge 200,777
Collar and hames, J. R. Gorby 200,710
Copper sheet manufacture, A. O'Neill 200,801
Cornice mould, etc., device, Glenn & Fern 200,653
Corset clasp, T. C. Candlish 200,693
Cotton cleaner, W. Herrmann 200,721
Cotton gin, A. L. Stietenroth 200,776
Cradle, J. Sprengard 200,805
Cultivator, S. L. Allen 200,681
Cup and other vessels, H. Berry 200,686
Dental plate mould, G. F. Reese 200,760, 200,761
Door plate, B. A. Wilson 200,810
Draught equalizer, J. A. Stephens 200,629
Draught equalizer for horse powers, L. Dodge 200,607
Drill, rock, C. Burleigh 200,690
Egg carrier, C. E. Dutrow 200,704
Electric machine, E. Weston (r) 8,102
Enameling sheet iron, F. G. & W. N. Niedringhaus, 200,626
Engine, gas motor, N. A. Otto *et al* (r) 8,107
Engine, reciprocating steam, C. Hunter 200,725
Fan, automatic, I. Zettl 200,812
Fence, E. Densmore 200,645
Fence barb, L. T. L. Wing 200,783
Fifth wheel for carriages, W. W. Grier 200,712
File, bill, S. Thompson 200,675
Filter, J. Foley 200,608
Fire alarm, A. S. Hickley 200,723
Firearm, A. Ball (r) 8,110
Firearm, O. Jones 200,794
Firearms, rear sight for, A. Roda 200,667
Fire escape, H. J. Bowman 200,600
Fire escape, T. F. Carpenter 200,694
Fire escape, D. Ottinger 200,665
Fire extinguisher, T. E. Connelly 200,699
Fireman's hat, J. M. De Celis 200,701
Flour manufacture, C. S. Marple 200,621
Freezing water, mould for, W. R. Close 200,605
Fruit basket, L. W. Beecher 200,786
Furnace, steam blast, E. R. Stege 200,674
Gas lighter and extinguisher, G. S. Dunbar 200,703
Gas works, by-pass for, H. G. Morris 200,799
Gate, R. Gray 200,655
Gate, J. D. Hagaman 200,716
Gun, accelerating, A. S. Lyman 200,740
Halter, A. Henkell 200,720
Hammers, power mechanism for, B. Murphy 200,748
Harrow, rotary, S. Hartman 200,656
Harvester, R. Emerson 200,705
Harvester reel, McCormick & Baker 200,796
Hat and bonnet box, A. B. Rice 200,802
Hat holder, J. M. Castillo 200,695
Hides and skins, drench wheel for, I. Wells 200,807
Hinge, W. Hull 200,657
Horses, administering medicine to, H. Hartman 200,717
Horses, driving, E. Wilder 200,781
Horses, hitching, E. Repp 200,763
Horses, toe weight for, H. Satterwhite 200,669
Hub attaching device, F. C. Lee 200,735
Hub for carriage wheels, J. Raddin (r) 8,108
Hydrant sewer trap, W. C. Amish 200,597
Injector, G. H. Little (r) 8,104, 8,105
Instep holder, J. H. Woodbury 200,785
Iron from refuse, separating, O. D. Woodruff 200,638
Ironing table, P. Dunbar 200,648
Ironing table, M. S. Prescott 200,758
Jibs, reefing, E. Rowell, 2d 200,766
Keyboard, C. A. Agren 200,640
Label holder, C. M. Bright 200,688
Lamp burner, A. T. Nord 200,627
Latch, T. P. W. Magruder 200,660
Lead, manufacture of white, G. L. Irwin 200,726
Leather skiving machine, C. Amazeen 200,682
Liftingjack, N. Hill 200,792
Lime bin, C. A. Lawton 200,618
Lock, sliding door, J. W. Schoonmaker 200,768
Lock, combination, R. Beachman 200,599
Loom shuttle, G. C. Mills 200,745
Lubricator, J. T. Meyer 200,623
Manure distributer, Jordan & Barron 200,729
Manure from night soil, manuf. of, C. M. Kimball 200,731
Match safe, G. R. Taylor 200,778
Meat and vegetable cutter, W. H. Goodchild 200,709
Metal plates, securing, W. G. Hyndman (r) 8,100
Mill, grinding, D. Hess 200,722
Motor, water, J. S. Williams 200,679
Name plate, E. A. Webster 200,634
Ore mill, J. W. Foulks 200,790
Ore separator, Wetmore & Rice 200,808
Oven, M. Nichols 200,625
Padlock, King & Pierce 200,617
Paper bag machine, A. B. Glover 200,654
Paper collar, S. Bates 200,685
Peg cutter, C. A. Corman 200,788
Photograph frame, A. Griffin 200,713
Piano forte sound board, G. W. Lyon 200,741
Pie turner, N. P. Maddocks 200,742
Planter, cotton seed, Nix, Stone, & Anderson 200,750
Planters, self dropper for, J. Butterfield 200,692
Plow, Knoblock & Bissell 200,734
Plow, W. J. Pirkle 200,755
Plow clevis, D. A. Kennedy 200,730
Plow, corn, P. Brannan 200,787
Plow, sulky, N. Elmer 200,650
Plowshare and point, C. M. French 200,707
Pocket book clasp, L. Messer (r) 8,106
Potato digger, C. O. Seamans 200,769
Press, cotton, Ivens & Dorand 200,615
Printing apparatus, K. Gray 200,711
Printing, autographic, J. Pumphrey 200,759
Pump, J. M. Willis 200,782
Pump reel, sand, Brawley & Morris 200,687
Radiator, W. H. Brown 200,601
Railway track, G. Lehlback 200,737
Recarburizer, Hunt & Wendel 200,724
Refrigerator, J. L. Alberger (r) 8,109
Refrigerator, S. P. Miller 200,624
Register, Bennor & Pond 200,642
Rolling blanks for axle clips, Clapp & Van Patten 200,603
Saw frame, buck, A. Holbrook 200,612
Sawing machine, T. F. Osburn 200,751
Scales, spring, J. A. & J. S. George 200,708
Scales, platform, S. J. Austin 200,688
Scales, spring, W. B. & J. S. Ross 200,765
Scissors, forceps, etc., L. A. Pichon 200,754
Screw driver, R. Munroe 200,747
Seeding machine sweeper, M. Barbour 200,684
Sewing machine shuttle, P. Diehl 200,606
Sewing machines, marking in, H. W. Fuller (r) 8,103
Shaft, reverse motion counter, Guild & Clark 200,715
Shoe exhibitor, T. E. Lewis 200,738
Shoulder brace and suspenders, A. P. Fuller 200,651
Sirup, flavored, Walker & Patterson 200,780
Spoke tenoning machine, Barnes & Miller 200,598
Spoke tenoning machine, R. W. Eaton 200,649
Spoon and ladle, J. Scheider 200,670
Spring, car, H. Gardiner 200,6 0
Square, try, H. Owen 200,628
Stamp, postage, J. Dewe 200,702
Staples, inserting and clinching, D. M Somers 200,774
Stove, cooking, G. G. Wolfe 200,811
Stove door, cooking, B. F. Clement 200,604
Stove, gasoline cooking, H. Wellington 200,686
Stove, oil, Shields & Liddle 200,770
Stove, safety, C. J. Smith 200,771
Stove, self extinguishing, W. F. Condon 200,697
Stove, culinary attachment, Dwyer *et al.* (r) 8,101
Tailor's measuring tool, E. O. Thompson 200,779
Telegraph relay, Allan & Brown 200,680
Telephone, J. Trobridge 200,631
Tether, W. B. Mathews 200,620
Thill coupling, H. Howell 200,793
Tile or brick kiln, R. G. McCullough 200,743
Tire setting machine, J. B. West 200,637
Tobacco curing, D. V. Davis 200,789
Toy carriage, H. Groth 200,714
Transom lifter, A. F. Pfeifer 200,753
Truck, car, J. G. Divoll 200,646
Tug link, W. P. Riley 200,808
Tug, spring draught, A. T. Nichols 200,749
Umbrella runner, H. S. Frost 200,609
Valve, check, J. F. Whitney 200,678
Valve for steam engines, G. A. Haworth 200,718
Valve gear for steam engines, G. W. Ziegler 200,639
Valve, rotary, D. W. Jones 200,728
Vegetable cutter, J. F. Rote 200,668
Vehicles, clip for, D. Kirk 200,795
Vessels, cleaning hulls of, H. J. Cole 200,696
Vessels, pin rail for, T. W. Hyde 200,613
Wagon box fastening, C. G. Conkling 200,698
Wagon gearing, etc., C. Baumgaertner 200,641
Washing machine, W. H. Nicholson 200,800
Washing machine, J. F. Pond 200,756
Washing machine, T. C. Welch 200,635
Watch balances, gauge for, J. Kinehan 200,732
Water meter, T. Walsh 200,676
Whip socket, A. Searls 200,671
Window cleaning device, E. P. Hall 200,611
Window hanging and fastening, J. Q. Ingham 200,614
Yoke fastener, A. W. Comstock 200,643